

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Amendment of the Commission's Rules Governing	)	RM-11660
Radiated Power Limits in the Cellular Radio Service	)	
Frequency Bands	)	

**JOINT COMMENTS OF  
BROADPOINT, LLC D/B/A CELLULAR ONE;  
CINCINNATI BELL WIRELESS LLC;  
NE COLORADO CELLULAR, INC.;  
SMITH BAGLEY, INC.;  
UNION TELEPHONE COMPANY D/B/A UNION WIRELESS**

Broadpoint, LLC d/b/a Cellular One, Cincinnati Bell Wireless LLC, NE Colorado Cellular, Inc., Smith Bagley, Inc., and Union Telephone Company d/b/a Union Wireless (collectively, the "GSM Licensees") hereby respond to the Public Notice in this docket released May 2, 2012 ("Notice"), regarding the AT&T Services, Inc. ("AT&T") petition for expedited rulemaking and request for waiver of the Commission's rules on cellular Effective Radiated Power ("ERP") limits. The GSM Licensees support the AT&T petition in part and believe it must be modified in part, in order to avoid significant reductions to existing service areas.

The GSM Licensees own and operate GSM/EDGE cellular and PCS networks in fourteen states and the only cellular service network in the Gulf of Mexico. The GSM Licensees provide coverage critical to energy, forestry, marine and fishing operations, transportation and logistics companies, military and public safety organizations, first responders, spill cleanup and coastal restoration workers, residents of tribal lands, agriculture, seismic prediction services, universities, elementary and secondary schools, among others. Accordingly, the GSM Licensees urge the Commission to adopt the hybrid rule changes proposed herein, modifying the AT&T

proposals in order to avoid significant injury to the coverage and operations upon which hundreds of thousands of customers rely.

## **I. Technical Aspects**

AT&T proposes that the current ERP limits for cellular base stations should be restated as power spectral density ("PSD") limits.<sup>1</sup> AT&T recommends a PSD limit of 250 watts/MHz in non-rural areas and 500 watts/MHz in rural areas.<sup>2</sup> AT&T states that its proposal would not result in harmful interference to other systems. This is, however, because the proposal would require 2G GSM/EDGE systems to pull back their boundaries to cover smaller areas.

Our radiofrequency engineers have determined that unless any changes to the power limits exempt 2G GSM/EDGE networks, the coverage of most GSM companies would be significantly and negatively reduced.<sup>3</sup> It is possible AT&T has deployed enough UMTS (3G) infrastructure that turning down a significant number of its GSM (2G) signals will not, on balance, harm the majority of its operations. Many GSM cellular networks, however, still use 2G technology. Hundreds of thousands of existing customers are still on 2G or EDGE networks, and these customers cannot be abandoned during this time.

If GSM coverage contracts, customers' roaming costs will instantly and dramatically increase, or if no other network serves that area onto which they can roam, they will lose signal altogether. Customers rely upon existing coverage, and companies' business and financial plans rely upon customers. ***The public interest rests in avoiding injury to existing system coverage***

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<sup>1</sup> / *Petition for Expedited Rulemaking and Request for Waiver, In the Matter of Amendment of the Commission's Rules Governing Radiated Power Limits in the Cellular Radio Service Frequency Bands*, RM-11660 (filed February 28, 2012).

<sup>2</sup> / *Id.*, at 3.

<sup>3</sup> / Existing coverage might be maintained if a tower had only a single transmitter per MHz. Carriers generally cannot make such inefficient use of the spectrum resource, however.

***while also permitting carriers to transition towards the deployment of broadband. A bifurcated or hybrid system of rules will best meet that dual public interest.***

The current Part 22 rules allow an effective radiated power (ERP) of 500 watts (non-rural) and 1000 watts (rural). This power limit is ordinarily applied as a limit on ERP per radio carrier (that is, frequencies; in this context “carrier” does not mean a telecommunications company), with no consideration for the bandwidth of the radio carrier. Technologies such as GSM have relatively narrow bandwidths, whereas technologies such as CDMA or UMTS have wider bandwidths. Accordingly, GSM systems have been deployed with different technological configurations than CDMA and UMTS systems. Moreover, the financing and business plans achieved by numerous licensees through lengthy negotiations with banks and equipment manufacturers for terms of years are designed to support these existing technological configurations, for such periods of time as such configurations remain, even if only for a period of time prior to a broadband deployment.

Shifting the coverage of existing systems, by reducing permitted power and thereby reducing existing licensees’ Cellular Geographic Service Areas (“CGSAs”) in an expedited rulemaking, would undermine reasonable due process to licensees, without sufficient notice and opportunity for comment, and also – regardless of the timing of the proceeding - would have far-reaching and numerous injurious consequences. Due process<sup>4</sup> should be provided with a deliberate approach to this proceeding in order to ensure all interested parties have sufficient time to examine the legal and engineering consequences.

An ERP density approach such as the AT&T proposal would normalize ERP density regardless of carrier count and bandwidth. The GSM Licensees would support the proposed

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<sup>4</sup> / See 5 U.S.C. § 553.

rules with regard to broadband operations, and we also suggest modifying the 32 dB $\mu$ V/m border field strength limit and the ERP term of the related Service Area Boundary (“SAB”) distance formulas in section 22.911 to be expressed in terms of electric field spectral density and ERP spectral density (PSD) respectively for broadband carriers. The proposed changes nevertheless should not be applied to existing 2G GSM/EDGE networks, for the reasons stated previously and hereinafter.

Following are summary calculations. As shown in Table 1 below, the assumptions are 3 dB cable loss and 16 dB antenna gain. Currently, a 20W GSM radio carrier in a 3-sector scenario would have an ERP of approximately 243W, which is easily less than the existing 500W and 1000W ERP levels. Even a 40W GSM radio carrier could meet the existing ERP limits in this scenario. This same 20W radio carrier, however, would have 730 W/MHz ERP density in, for example, the frequent scenario of 3 TRX per 1 MHz of spectrum; this density far exceeds the proposed 250 W/MHz (non-rural) and 500 W/MHz (rural) levels.

In order to comply with the new ERP density levels that AT&T is proposing, 2G or EDGE GSM transmitter power would need to be reduced significantly and adversely, *from 20W per transmitter (TRX) down to approximately 4W (non-rural) or 8W (rural) per TRX* in a scenario with 5 TRX per 1 MHz of spectrum. Alternatively, if three transmitters are operating for each MHz of spectrum, then the reduction would be from 20W (non-rural) or 40W (rural) per transmitter down to approximately 6.85W (non-rural) or 13.7W (rural). This would have a material and harmful effect on coverage. *The proposal appears likely to result in as much as a one-half or two-thirds reduction in the area covered by each GSM (2G)/EDGE transmitter.* For example, in a rural deployment at 40W per TRX and 3 TRX per MHz of spectrum, the proposal would reduce transmitter power to 13.7W, resulting in a 41% decrease in cell radius and a 66%

reduction in area covered (assuming a free space loss propagation model). *Ironically, the greatest coverage reductions would occur in areas where 2G companies are doing spectrum adjustments to make room for 3G they are working to deploy.*

For CDMA, 40W would not meet the non-rural limit and accordingly the proposal should be scrutinized with care. For UMTS, the proposal would not require reductions in power because a UMTS signal carrier is much wider and EIRP density is already low enough even at 40W per signal carrier. For 2G GSM or EDGE, the proposal must be altered with a hybrid (bifurcated) approach, so as not to create drastic problems for coverage, customers, and the public interest. The proposal would require licensees to decrease EIRP/ERP on 2G/EDGE systems, which would significantly decrease the coverage areas of such systems.

Table 1

	GSM (current)	GSM (non- rural)	GSM (rural)	CDMA (current)	UMTS (current)	
BTS TX Power per TRX	20	4.11	8.22	40	40	W
BTS TX Power per TRX	13.01029996	6.138418219	9.148718175	16.02059991	16.02059991	dBW
cable loss	3.00	3.00	3.00	3.00	3.00	dB
TX antenna gain	16	16	16	16	16	dB
EIRP	26.01029996	19.13841822	22.14871818	29.02059991	29.02059991	dBW
EIRP	399.052463	82.00528115	164.0105623	798.104926	798.104926	W
ERP	23.86029996	16.98841822	19.99871818	26.87059991	26.87059991	dBW
ERP	243.2372001	49.98524463	99.97048925	486.4744003	486.4744003	W
TRX bandwidth	200	200	200	1228.8	3840	kHz
TRX per MHz	5	5	5	0.813802083	0.260416667	TRX/MHz
EIRP density	1995.262315	410.0264057	820.0528115	649.4994515	207.8398245	W/MHz
ERP density	1216.623363	250.0161011	500.0322021	396.0362509	126.7316003	W/MHz

## II. Adverse Effects of the Proposal Unless Modified

Changing the signal strengths of licensed operations would endanger the communications – and thus in some cases the livelihoods and safety – of customers that suddenly lose service

from their existing 2G/EDGE service providers. This risk is particularly significant in rural areas where it is not infrequent that no other network is available on which the customer could roam. Alternatively, in areas where service is lost but another carrier still has 2G technology onto which the customers could roam and a roaming agreement with the current provider, the customers suddenly would be required to pay per-minute roaming charges in areas where they are used to communicating without additional charges.

These changes would materially injure existing citizens, small businesses, large businesses, and the public interest. In some locations, withdrawing cellular service would leave no alternative service available, and in other locations, substantial roaming charges would suddenly burden customers.

In addition, AT&T's proposal, if applied to 2G/EDGE emissions, would create an administrative burden on Commission staff that cannot be underestimated. If licensees' cellular service areas were dramatically reduced, customer complaints to the FCC about increased roaming costs or reduced home service areas would skyrocket. Moreover, licensees would need to file numerous changes in SAB and CGSA contours, resulting in a cumbersome administration burden upon Commission staff during this already busy time.

AT&T's proposal would change the cellular licensing regime established over the past twenty years, by requiring 2G GSM/EDGE systems to reduce power, thus significantly reducing their existing SABs. The immediate effect would be the creation of dead zones and an inability for adjacent cell sites to hand off communications properly. Particularly in rural areas, where the Commission has long recognized the difficulties in justifying investment to provide high-quality coverage in light of challenging terrain, sparse population, and difficult demographics, any rule that reduces consumer access to mobile services must be rejected.

Millions of customers, including emergency operations such as various Coast Guard and spill cleanup vessels in the Gulf of Mexico, business-critical energy company communications, and marine operations, are served by and rely upon the full coverage areas of 2G and EDGE technologies; reducing those coverage areas would disrupt customer operations as well as carriers' business plans, making transitions to broadband even more complex.

Dropped calls and dead zones in rural areas represent a critical safety concern, which our proposal would avoid. First and foremost, any reduction of coverage is a safety risk. Second, dropped calls and dead zones deny rural consumers access to services reasonably comparable to those in urban areas. Third, withdrawal of signal by one carrier increases the potential for roaming charges incurred when a handset enters an area that the home carrier no longer covers.

As the Commission is aware, many rural and regional wireless operators still have many customers using 2G handsets. Embedded 2G handsets often represent more than fifty percent of a carrier's customer base. In order to transition these customers to advanced 3G and 4G networks, carriers not only must build new facilities but also must have access to the 3G and 4G handsets and roaming agreements needed to compete. Thus, on some networks, a long transition period is needed in order to enable the placement of these building blocks prior to the decommissioning of 2G networks.

Many regional and smaller carriers cannot obtain broadband roaming agreements on reasonable terms with the largest two carriers. Without broadband roaming, there is no basis upon which to roll out broadband service. In such areas, until a 4G solution is developed, carriers have a responsibility to protect the signal coverage used by existing customers and the Commission should take no action that harms citizens by reducing coverage.

### **III. Proposed Modifications**

#### **A. The GSM Licensees Support the AT&T Proposal If Modified to Exempt Non-Broadband Operations.**

The GSM Licensees do not believe the foregoing adverse results were intended by AT&T. AT&T's proposal can be implemented for broadband networks without the adverse consequences described above. The GSM Licensees respectfully request that the Commission adopt a bifurcated system which permits carriers to operate under the AT&T-proposed limits for broadband operations, but to operate within the currently existing ERP limits for GSM/EDGE systems, including existing, modified, and additional base stations, until such base stations are decommissioned or replaced by a broadband overlay. This hybrid approach will recognize and protect the public interest in vital communications, enabling network stability and responsible service of customers' needs during the transition to broadband and beyond. This solution will completely avoid the creation of dead zones, by simply bifurcating Section 22.913 to apply the existing rule to all GSM or EDGE operations excepting broadband systems, which would be covered by the new provisions proposed by AT&T. This solves the problem that AT&T discusses, while avoiding negative consequences for current operations.

#### **B. The Power Requirements Should Establish Certain EIRP and PSD Limits For Rational Unification of Operational Bands**

Union Wireless is very concerned about the AT&T proposal and its potential for unintended consequences to GSM systems operating on 850 MHz. In Union's opinion, the goal of any changes to the power requirements should be unification of all operational bands for mobile communications and not further fragmentation and confusion of operators who happen to operate in multiple bands on the same tower site. For example, an unprecedented scenario that could result from this proposal would be that the higher frequency systems operating on the PCS

or AWS bands would start to cover greater distances than lower frequency systems operating in the cellular bands. Ordinarily, spectrum in the cellular bands has greater coverage than systems in higher frequency bands as a result of its propagation characteristics, and accordingly has been accorded greater value in existing loans and investments. In order to ensure adequate power to maintain the system coverage achieved to date for customers, changes to the rules should include the following.

- 1) EIRP should be used rather than ERP, since EIRP is the measurement used for the PCS, AWS and 700 bands.
- 2) Break the carriers into those under 1MHz of bandwidth and those greater than 1MHz of bandwidth, as was done with the other bands. Carriers less than 1MHz should have 1640W EIRP in rural areas and 820W EIRP in non-rural areas. This will keep the limits at today's levels and not force reduction in coverage by GSM carriers.
- 3) Carriers greater than 1MHz of bandwidth should have a PSD limit set to 1640W/MHz EIRP for rural areas and 820W/MHz EIRP for non-rural areas. This is similar to the method used for AWS, excepting that this is half the power, making the system equal when looking at the differences in effective coverage due to propagation characteristics.

#### **IV. Conclusion**

In light of the foregoing, the GSM Licensees urge the Commission to modify the AT&T proposal so as to prevent contraction of 2G and EDGE networks. The current field strength limits should be retained for 2G GSM/EDGE transmissions until they are replaced with broadband technologies; the limits proposed by AT&T should apply only to 3G or other broadband technologies. This modified proposal will protect customers' communications on 2G GSM or EDGE systems, including public safety communications, from dangerous disruption or

significantly increased roaming charges, while permitting business plans for conversion to broadband to proceed. In turn, this will permit continuity of communications for business, nonprofit and governmental customers such as transportation and logistics companies, military and public safety organizations, U.S. Coast Guard vessels, first responders, coastal restoration workers, residents of tribal lands, and educational institutions.

Respectfully submitted,

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